Is Europe living within the limits of our planet?

An assessment of Europe's environmental footprints in relation to planetary boundaries

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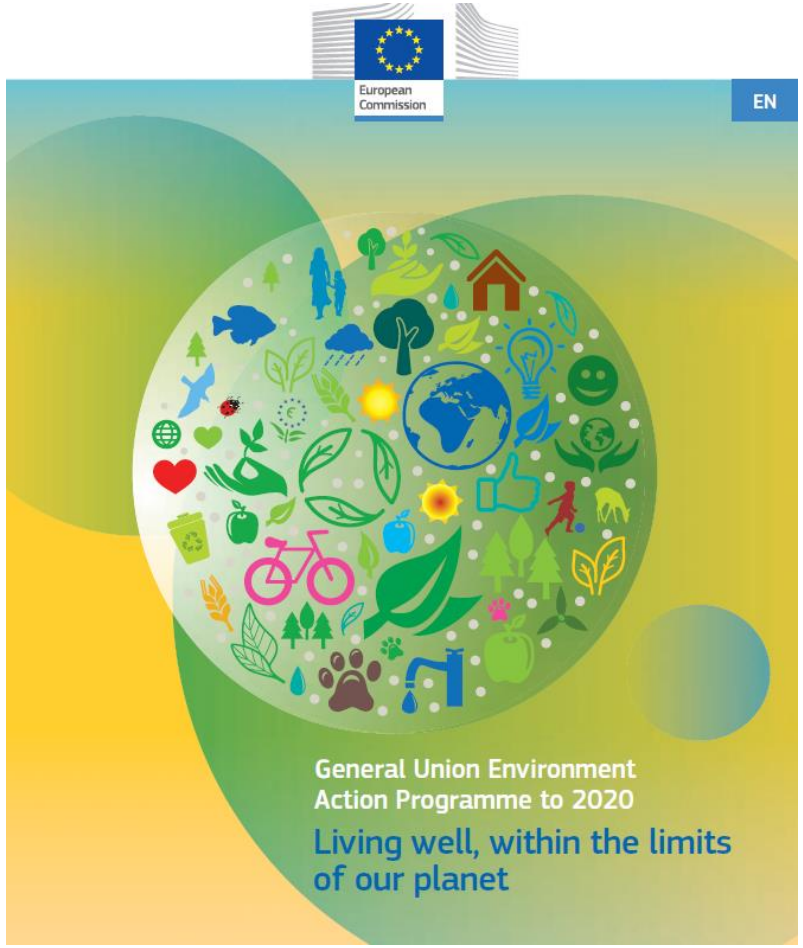
Webinar by Jutta Paulus (MEP) | 11 June 2020

European Environment Agency

EU policy context for planetary boundaries

The 7th Environmental Action Programme

‘Living well, within the limits of our planet’



The European Green Deal

U. von der Leyen:

”Europe must lead the transition to a healthy planet”

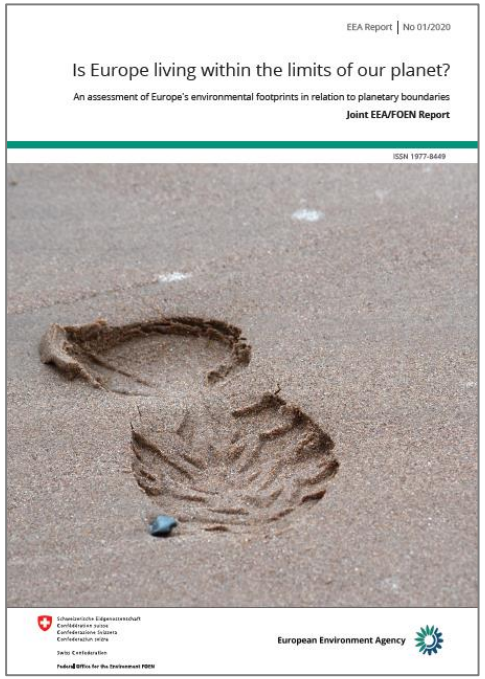
Explorations towards operationalising the ambitious visions

A five-year project trajectory:

- **2015**: Framing of knowledge challenges within the Environment Knowledge Community (EKC)

- **2016-17**: Stock-taking of scientific knowledge (technical report, link here)

- **2018-20**: Systematic calculations + assessment (EEA/FOEN report, links: full version, summary brochure)



Explorations towards operationalising the ambitious visions

Five years of institutional and scientific collaboration, and knowledge co-creation:

- EU-institutional (EKC)
- International (UNEP GRID Geneva)
- National (FOEN Switzerland)

- Research partners
  - Stockholm Resilience Centre / Stockholm University
  - Netherlands Environmental Assessment Agency (PBL)
  - Stockholm Environment Institute
  - Shaping Environmental Action
  - Metabolic

Stockholm Resilience Centre
Sustainability Science for Biosphere Stewardship
Stockholm University

SEI Stockholm Environment Institute

PBL Netherlands Environmental Assessment Agency

ea Shaping environmental action

METABOLIC

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Three main knowledge questions

A) What is a safe operating space for Europe?

B) What is the global environmental footprint of Europe?

C) Does Europe live within its safe operating space?

A) What is a safe operating space for Europe?

- Requires the allocation of **European shares** of the global safe operating space.
- Inevitably, this **involves normative choices**.
- Therefore, a basket of **different allocation principles** has been explored, each with multiple calculation approaches (instead of using Europe's proportion of the global population only)

Median values (independent of any PB)

- Application of the resulting shares to the different planetary boundaries to derive **European limits**.

B) What is the global environmental footprint of Europe?

- Calculation of European footprints using a **consumption-based approach**, with the state-of-the-art multi-regional input-output model Exiobase (developed through EU FP7 research funding)

exiobase

- Four earth system processes analysed in this study

Nitrogen cycle (biogeochemical flows)

Phosphorus cycle (biogeochemical flows)

Land system change

Freshwater use

Strongly interwoven with core planetary boundaries (biosphere integrity, climate)

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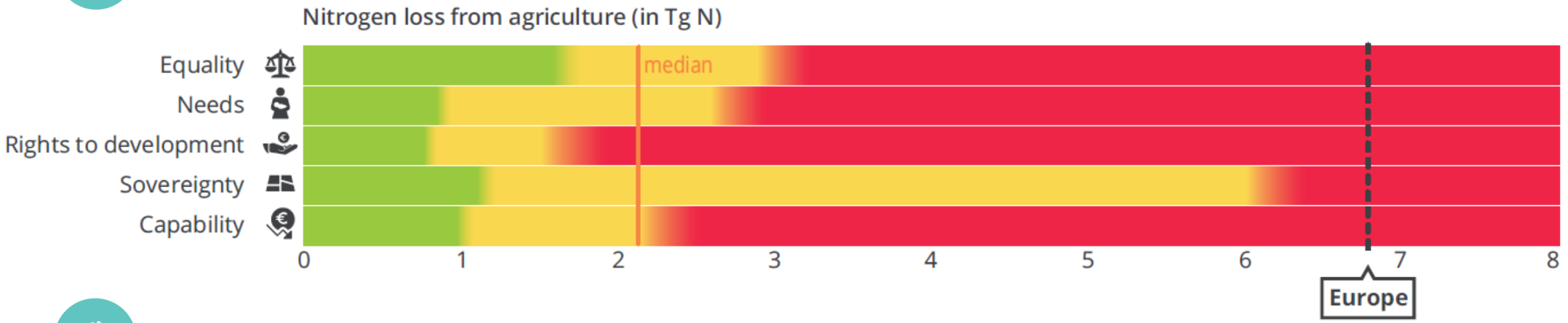
C) Does Europe live within its safe operating space?

- Comparison of European limits with European footprints

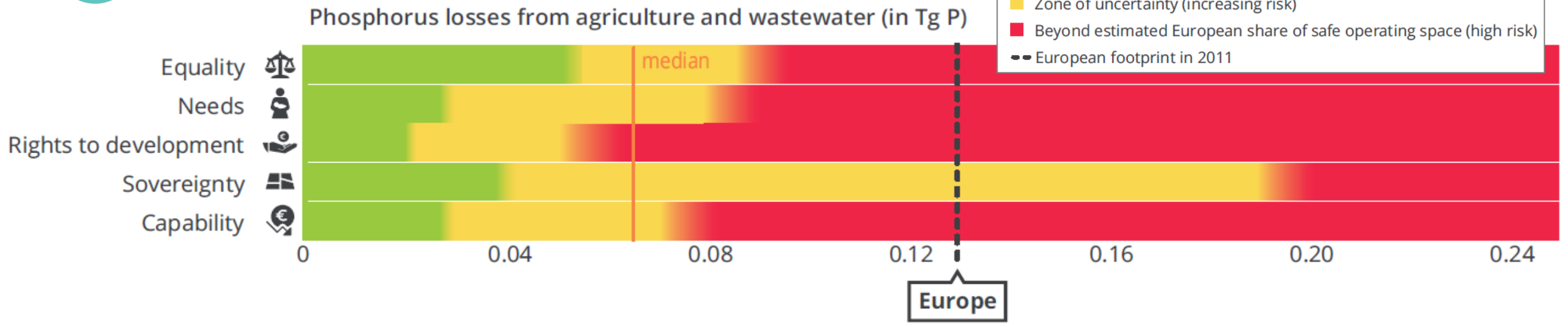
Planetary boundary		Results question A			Results question B	Results question C
		European limit				
Name	Control variable	Minimum	Median	Maximum	European footprint	Factor over-/ undershot
Nitrogen cycle (biogeochemical flows)	Loss of nitrogen from agriculture per year (Tg N/year)	0.80	**2.10**	6.00	**6.80**	3.3
Phosphorus cycle (biogeochemical flows)	Loss of phosphorus from fertilisers and waste per year (Tg P/year)	0.03	**0.07**	0.19	**0.13**	2.0
Land system change	Anthropised land (10^6 km^2)	0.50	**1.40**	4.10	**2.50**	1.8
Freshwater use	Blue water consumption (km^3)	110	**291**	840	**99.1**	0.3

C) Does the EU live within its safe operating space?

Nitrogen cycle (biogeochemical flows)

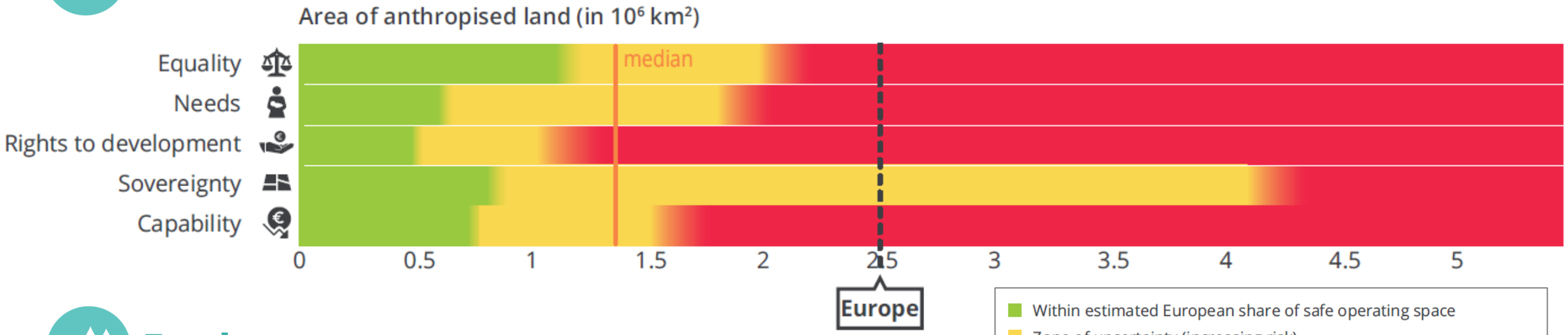


Phosphorus cycle (biogeochemical flows)

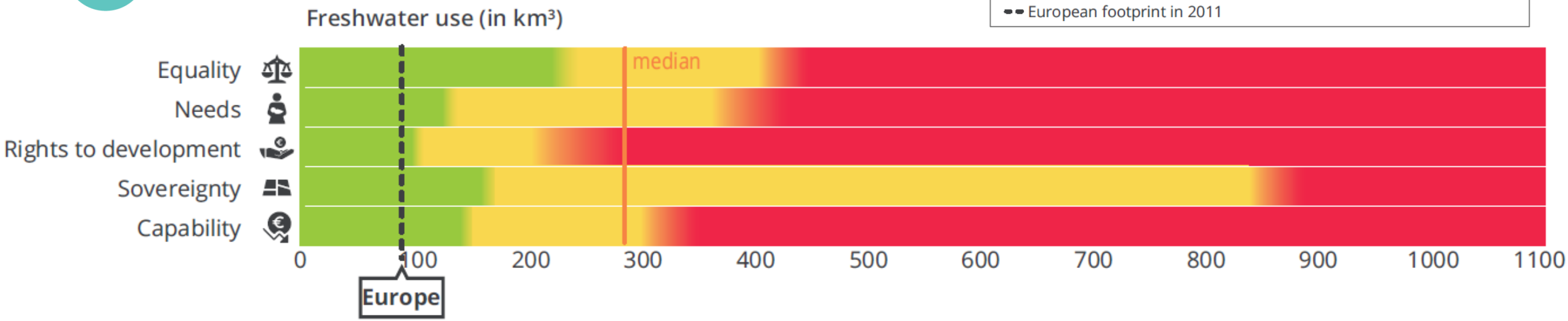


C) Does the EU live within its safe operating space?

Land system change



Freshwater use



Conclusions – key messages and policy

- Europe faces **key systemic challenges** related to **nutrient pollution** (nitrogen and phosphorus) and **land system change**.
- The **European footprint** should be **reduced by about a factor of 3** for nitrogen losses and a **factor of 2** for phosphorus losses and land change.
- Profound transformations of the current **systems of consumption and production** will be needed, including society's consumption patterns. The **food system** is a key **leverage point**.
- The policy objectives under the **European Green Deal** provide a unique **opportunity** to deliver on European territory, for example:
  - EU climate law / climate neutrality
  - Farm-to-fork and Biodiversity Strategy
  - Zero pollution action plan

Conclusions – knowledge

- This study provides **important advances** on how the concept of planetary boundaries can be operationalised in Europe.
  - A basket of multiple allocation principles instead of 'per capita' only.
  - Linking planetary boundaries with consumption-based footprints.

- Crucial knowledge gaps
  - Understanding of global environmental limits.
  - Global vs. regional processes (differences between regions, countries).
  - Improved understanding of European footprints (**financial investments required** to update and expand existing models!).

- Collaboration with **science networks** is essential.

Thank you

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